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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/493,709	01/28/2000	Elias J. Nemer	NTL-3.2.113/3199(11334RO)	2562

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666 THIRD AVENUE
NEW YORK, NY 10017

EXAMINER

KNEPPER, DAVID D

ART UNIT	PAPER NUMBER
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2654

DATE MAILED: 03/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/493,709

Applicant(s)

NEMER, ELIAS J.

Examiner

David D. Knepper

Art Unit

2654

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-111 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 12, 17, 19-24, 32, 34-42, 50, 52-57, 65 and 95-111 is/are rejected.
- 7) ☒ Claim(s) 10, 11, 13-16, 18, 25-31, 33, 43-49, 51, 58-64 and 66-94 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>28 Jan 2000</u> . | 6) <input type="checkbox"/> Other: _____ |

1. Applicant's correspondence filed on 22 Oct 2004, 16 May 2000, 27 April 2000 and 25 Feb 2000 has been received and considered. Claims 1-111 are pending.

Title

2. The title is objected to because it is too verbose. "Method and Apparatus for" should be deleted.

Abstract

3. The Abstract of the Disclosure is objected to because of poor grammar regarding the prepositional phrase "of optimal filtering" to describe "frequency domain" and improper use of the word "two" in "signal-two-noise ratio". Correction is required. See M.P.E.P. § 608.01(b).

Drawings

4. The drawings are objected to for the reasons given below.

Figure 1 is described in the specification as "showing a known spectral subtraction scaling method." Thus, Figure 1 should be labeled as "prior art" which is the conventional terminology in US patents, laws and rules instead of "related art" which is considered ambiguous and misleading in the context in which it is presented. No reference is made in the specification to the blocks numbered in figure 3 nor do the blocks have descriptions or abbreviations inside them. The extraneous text of figure 3 should be placed in appropriate blocks or removed. It is unclear what relationship exists between blocks 302, 304, 306, 308 and 312 because no indication of data flow or input/output is evident. Two lines fail to interconnect or show direction of data flow between any elements of figure 3. Figure 5 is objected to as a "black box"

depiction which fails to show any meaningful processing. The details contained within block 502 should be shown to give this element significant meaning or the figure should be labeled as "prior art". Table 1 was included on a separate sheet instead of in the specification where tables are supposed to appear. It is unclear whether this was an intentional attempt to improperly treat a table as a drawing. If the applicant prefers having Table 1 as a drawing, then it must be properly labeled as such with reference numbers to the specification. Correction is required.

Priority Claims

5. The applicant(s) should check their filing receipts and/or the Patent Application Information Retrieval (PAIR) system for the acknowledgment of their **domestic** priority or benefit claims (if any) under 35 USC 119(e), 120 or 121 (37 CFR 1.78).

Claims

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-9, 12, 17, 19, 20-22, 32, 34-42, 50, 52-55, 65 are rejected under 35 U.S.C.

§ 103 as being unpatentable over Vilmur (4,811,404) in view of Ephraim (Speech Enhancement Using a Minimum mean-Square Error Short-Time Spectral Amplitude Estimator) and Cappe (Elimination of the Musical Noise Phenomenon with the Ephraim and Malah Noise Suppressor).

As per claim 1, “reducing noise in a transmitted signal” is taught or suggested by Vilmur’s Noise Suppression System (see title):

“determining a respective total signal energy and a respective current estimate of the noise energy for at least one of said plurality of frequency bands” (his col. 4, lines 44-46 which teaches The individual channel voice metric values are summed to create a first multi-channel energy parameter and – thus it is clear that Vilmur calculates total signal energy as well as energy estimates for individual frequency bands);

“determining a respective local signal-to-noise ratio for said at least one of said plurality of frequency bands” (his block 853 of figure 4a CALCULATE RAW SNR ESTIMATE INDEXX(CC) FOR CHANNEL CC);

“determining a respective smoothed signal-to-noise ratio” (suggested by Ephraim’s smoothing performed with equation values α and β as on page 1117, bottom, right column – see also page 119, which explains that the averaging function that this provides will result in improved speech quality by removing ‘musical noise’ – see also Cappe who performs a study on Ephraim’s technique and finds that In practice, it can be considered that the EMSR corresponds to a smooth transition between the two suppression rules... as on page 346, bottom right and that the advantage results from the nonlinearity of the averaging procedure, page 347, upper right column); and

“calculating a respective filter gain value” (his means for producing a gain value for each individual channel, claim 1, col. 12, lines 43-45).

It is noted that Vilmur does not explicitly teach the “smoothed signal-to-noise ratio”. However, Ephraim (and Cappe) teach that smoothing the SNR ratio using an averaging function will result in improved sound characteristics as noted above. It would have been obvious for a person having ordinary skill in the pertinent art, at the time the invention was made, to utilize the smoothing function of Ephraim in a system such as Vilmur’s that performs frequency band channel analysis using SNR because it will remove unpleasant noise artifacts that may otherwise result from attenuating noise without doing it.

Claim 2: This form of equation is taught by Ephraim on page 1117, with equation (47).

Claims 3-9, 12, 17, 19 and 20-22 are considered obvious in view of the similar equations taught by the common application of gain values by Vilmur to attenuate (and thereby reduce) noise in figure 1. Particular applications of the parameters is shown by Ephraim on pages 1114-1119 and Cappe on pages 345-347).

Claim 32, 50, 65: This form of equation is taught by Ephraim, page 1118, equation (53) shown also by Cappe, page 346, equation (3).

Claims 34-42, 52-55 and 95-111 are rejected under similar arguments as applied to claims 1-9, 12, 17, 19, 20-22, 50 and 65 above.

8. Claims 23, 24, 56-58 are rejected under 35 U.S.C. § 103 as being unpatentable over Vilmur (4,811,404).

Claim 23 is broader than claim 1 as it only includes steps for determining a “non-speech frame” used as “a noise energy level” which is taught by Vilmur’s analysis in col. 5-6 to correctly classified as noise (co. 6, lines 50-51) and then “filtering said at least one band as a function of said estimated noise level” which is suggested by his use of the SNR estimates for individual channels – see his col. 7, lines 46-49: Hence, the channels containing the narrowband noise burst are attenuated so as to prevent them from detrimentally affecting the gain table look-up function.

It is noted that Vilmur does not explicitly use the terminology “filtering” but it is obvious that the attenuation noted above is performed by his claimed “means for modifying the gain” (see claims 1-50) for which one of ordinary skill in the art would understand reads upon a filter.

Claim 24: Identifying speech from non-speech (noise) if the frame is stationary is obvious because Vilmur teaches that he only updates background noise estimates when the analysis of individual frequency bands indicates noise. For channels that don’t change, he would continue to determine speech from noise without needing to do anything. That is, what the applicant is claiming here is a trivial matter according to the prior art.

Claim 56 is rejected under similar arguments as applied to claims 23-25 above.

9. Claims 10, 11, 13-16, 18, 25-31, 33, 43-49, 51, 58-64, 66-94 are objected to as dependent upon rejected claims but would be allowable if re-written in independent form to include all the limitations of any intervening claims. Subject matter in these claims is allowable because the prior art does not teach the combination including the calculations based upon LPC prediction error and skewness.

10. Some correspondence may be submitted electronically. See the Office's Internet Web site <http://www.uspto.gov> for additional information.

Please address mail to be delivered by the United States Postal Service (USPS) as follows:

Mail Stop _____
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Fax phone number for Group 2600 is (703) 872-9306

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David D. Knepper whose telephone number is (703) 305-9644. After 28 March 2005, the examiner's phone number will be (571) 272-7607. The examiner can normally be reached on Monday-Thursday from 07:30 a.m.-6:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil, can be reached on (703) 305-9645. After 28 March 2005, Mr. Dorvil's phone number will be (571) 272-7602.

For the Group 2600 receptionist or customer service call (571) 272-2600.

For general questions to the USPTO, you may call **800-786-9199** (IN USA OR CANADA) or **703-308-4357** for assistance from Customer Service Representatives and/or access to the automated information message system. **TTY** customers can dial **703-305-7785** for customer assistance.



David D. Knepper
Primary Examiner
Art Unit 2654